AMS AIR-SEA Interaction Conference, May 2001
Special Session on SAR for Marine Winds

Improving SAR Sampling of the Ocean Surface: Current Status of a New Ocean SAR Mapper Concept

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The fine resolution of synthetic aperture radar (SAR) yields exciting and unique views of the two-dimensional ocean surface and its interactions with the atmosphere, long waves, and currents. However, the dynamics of most of these important oceanic and atmospheric features and interactions have time scales (hours to days) that are shorter than may be sampled by any past, present, or near future SAR satellite. An entirely new satellite concept is under study that attempts to improve/match these short timescales. Also, some applications, particulary the derivation of regional wind speed, require accuracies that have implications on the SAR instrument design and calibration. In this paper, we will review current mission concepts being considered, including multiple antennas and spacecraft, to improve SAR ocean sampling rates. We will also review the results of a recent SAR instrument design study that addresses a broad range of ocean measurement requirements and how recent results using SAR impact the design.